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CAMPAIGN FOR THE ENVIRONMENT · EARTHJUSTICE · EARTHWORKS OIL & GAS
ACCOUNTABILITY PROJECT · ENVIRONMENTAL ADVOCATES OF NEW YORK ·
FRACK ACTION · FOOD AND WATER WATCH · NATURAL RESOURCES DEFENSE
COUNCIL · NEW YORK PUBLIC INTEREST RESEARCH GROUP · RIVERKEEPER, INC. ·
SIERRA CLUB

BY EMAIL AND FIRST CLASS MAIL

July 27, 2015

Marc Gerstman, Acting Commissioner
New York Department of Environmental Conservation
625 Broadway
Albany, NY 12233-1011

Re: Liquefied Petroleum Gas (Propane) Fracturing Applications

Dear Commissioner Gerstman:

We are writing to you to express concern regarding two reported well permit applications in Tioga County, NY that propose to use liquefied petroleum gas ("LPG") as a fracturing agent to target natural gas in the Utica and Marcellus formations.¹ We again congratulate and thank the Department for its comprehensive review of, and proper decision to prohibit, proposed high-volume hydraulic fracturing ("HVHF") in New York State. We have full confidence that the Department will apply the same thoughtful review to these applications.

As you may recall, the above listed groups sent you the attached letter on April 11, 2012 expressing similar concerns after several newspapers reported that the Canadian gas company, GasFrac Energy Services, Inc. ("GasFrac"), reached a preliminary agreement with the Tioga County Landowners Association to employ Houston-based driller eCORP in drilling several gas wells in Tioga County using the unconventional technique of fracturing with LPG.² At the time it was suggested that the landowners association's strategy was to bypass the de facto moratorium through the use of an alternative fracturing agent. We strongly urged that no permit could be issued for LPG fracturing without full compliance with SEQRA.

Propane fracturing presents significant adverse environmental impacts similar to and beyond those identified in the Final Supplemental Generic Environmental Impact Statement ("FSGEIS") for HVHF and we urge the Department to require the preparation of a comprehensive supplemental generic environmental impact statement pursuant to the State Environmental Quality Review Act ("SEQRA"). Since propane fracturing would result in many of the same

¹ July 8, 2015 <http://www.ithacajournal.com/story/news/local/2015/07/08/fracking-propane-proposed-tioga-county-ny/29863383/>

² Associated Press, NY Landowners Plan to Frack Using Liquid Propane, PENNLIVE.COM (Mar. 29, 2012), available at: <http://www.pennlive.com/newsflash/index.ssf/story/ny-landowners-plan-to-frack-usingliquid/3253f759fcf943a9b48b748d43c3c24c>.

unmitigated significant adverse impacts identified in the Findings Statement for HVHF that formed the basis for its prohibition, it would appear inevitable that, upon completion of the SEQRA process, these pending applications would also be denied.

While we believe that the Findings Statement for the FSGEIS outlined many risks that are shared with propane fracturing, our 2012 letter sets forth other considerable known risks which are distinct from HVHF or conventional drilling. These additional risks, which would significantly impact the environment, are not adequately addressed in the 1992 GEIS for conventional drilling or the FSGEIS for HVHF. The main component used in LPG fracturing, propane gas, is itself highly flammable and because it is heavier than air, it naturally pools on the ground when leaked, creating a clear and substantial threat of explosion³ – a risk highlighted by two major explosions in 2011 at GasFrac well sites that injured fifteen workers and caused the company to suspend all of its operations for two weeks.⁴ Additional hazards will no doubt result from trucking thousands of gallons of LPG to the well site,⁵ compressing and re-condensing the LPG for reuse, and mixing the LPG with chemicals for use in fracturing.⁶

While LPG fracturing has been presented as more environmentally benign than water-based HVHF, both require the addition of toxic chemicals. In LPG fracturing, additives include gelling agents, breakers and crosslinkers, and may contain chemicals such as surfactants, amines, iron salts, and other contaminants.⁷ In addition, as with HVHF, LPG fracturing returns polluting products to the surface that must be properly handled and disposed, in this case, flammable gases that would have to be collected in pressurized tanks or flared⁸ – a step generating air emissions and leaks that can harm public health and safety.

Even more alarming than the known risks are the unknown and potentially numerous hazards associated with LPG fracturing. Because the use of LPG fracturing is recent and it employs a proprietary method owned by GasFrac, there is little publicly available information on the

³ Canadian Centre for Occupational Health and Safety, Working Safely with Propane (last visited Apr. 4, 2012), available at http://www.ccohs.ca/oshanswers/chemicals/chem_profiles/propane/working_pro.html.

⁴ Nathan VanderKlippe, Husky Well Fire Injures Several Alberta Workers, CTV NEWS (last visited Apr. 3, 2012), available at: <http://www.ctv.ca/generic/generated/static/business/article1932947.html>.

⁵ Although LPG fracturing uses about one quarter of the truck trips used in normal hydraulic fracturing, these trucks will be carrying highly explosive liquefied gasses as opposed to water.

⁶ See e.g. Don LeBlanc et al., Application of Propane (LPG) Based Hydraulic Fracturing in the McCully Gas Field, New Brunswick, Canada, SOCIETY OF PETROLEUM ENGINEERS (June 2011) abstract, available at <http://www.onepetro.org/mslib/app/Preview.do?paperNumber=SPE-144093-MS&societyCode=SPE>.

⁷ See, for example, descriptions from two of GasFrac's patent applications: "One example of a suitable gelling agent is created by first reacting diphosphorous pentoxide with triethyl phosphate and an alcohol... The orthophosphate acid ester formed is then reacted with aluminum sulphate to create the desired gelling agent." GasFrac, "Liquified Petroleum Gas Fracturing System," Intl. Patent App. No.: PCT/CA2007/000342 (Filed: February 2, 2007) available at <http://bit.ly/HiSdVV>; "An example of a commercially available ferric iron activator composition is 'EA-3 TM'... Suitable activator compositions also may comprise amines, surfactants, water, or other suitable components." GasFrac, "Volatile Phosphorus-free Gelling Agents," Intl. Patent App. No.: PCT/CA2009/001159 (Filed: Aug. 2009), available at <http://bit.ly/HgF4h8>.

⁸ GasFrac, LPG Frac Flow Back Guide, Section 7.0. "LPG Hazards," (Jan. 2011), available at <http://www.gasfrac.com/assets/files/LPGVantageFracFlowbackGuidev9finalJan2011.pdf>.

process.⁹ GasFrac has multiple patents for its LPG fracturing system, often with slightly different descriptions of chemical additives.¹⁰ Because GasFrac considers the actual chemical recipes to be “trade secrets,”¹¹ it is difficult to know exactly what chemicals are actually being used as gelling agents or for other purposes. To date, there has been no independent empirical analysis of the complete life cycle of LPG fracturing. In light of the facts that, GasFrac filed for bankruptcy protection in January 2015¹² and that there has been little publically reported progress with the technology, it remains unclear whether this critically needed information can be made available or whether LPG fracking is ultimately viable as a practice.

Neither the known nor the unknown risks from LPG fracking have ever been adequately addressed in any EIS. By its own terms, the recently completed FSGEIS was limited to the study of HVHF, defined as horizontal or vertical wells “using 300,000 gallons of water or more per well.”¹³ Furthermore, it frankly acknowledges that LPG fracturing was not considered within the scope of the study, noting that “[a]s to the use of propane rather than water, this technology would have to be evaluated pursuant to a specific proposal and also may raise other environmental issues not identified or assessed in this SGEIS.”¹⁴ LPG fracturing is likewise well outside of the scope of the 1992 GEIS. LPG itself is discussed only in the context of underground storage of the gas, and reference to LPG constituents used in fracturing, such as “propane” and “butane,” appears only once in the entire document.¹⁵

Bearing all of this in mind, we write to remind the Department not only of the importance of comprehensive environmental review before permitting any LPG fracturing wells in New York State, but also of its mandatory nature. As you have said in reference to the environmental review process for permitting HVHF, “[t]he goal of the process all along has been to identify the risks associated with [HVHF], to see if they can be mitigated in a way that protects the environment.”¹⁶

In consideration of the DEC’s final conclusion that: “... there are no feasible or prudent alternatives that would adequately avoid or minimize adverse environmental impacts and that address the scientific uncertainties and risks to public health from this activity. The Department’s chosen alternative to prohibit high-volume hydraulic fracturing is the best alternative based on the balance between protection of the environment and public health and economic and social

⁹ Anthony Brino & Brian Nearing, New Waterless Fracking Method Avoids Pollution Problems, But Drillers Slow to Embrace It: Little-noticed drilling technique uses propane gel, not water, to release natural gas. Higher cost, lack of data and industry habit stand in the way, REUTERS (November 6, 2011), available at <http://www.reuters.com/article/2011/11/06/idUS375448304420111106>.

¹⁰ GasFrac Annual Information Form for the Year Ended December 31, 2011, 8-12 (Dec. 31, 2011) (A table of GasFrac patents can be found under “Intellectual Property”), available at <http://www.gasfrac.com/assets/files/2011%20AIF%20March%2016%202012.pdf>.

¹¹ Id. at 8 (“GASFRAC relies upon trade secrets, its know-how and patent applications that have been filed or are in preparation in order to provide its innovative services to its customers”).

¹² <http://www.bizjournals.com/sanantonio/blog/eagle-ford-shale-insight/2015/01/gasfrac-files-for-bankruptcy-protection-in-san.html>

¹³ 2015 Final Findings Statement for SGEIS on HVHF at 2 (defining HVHF as “the stimulation of a well using 300,000 gallons or more of water as the primary carrier fluid in the hydraulic fracturing fluid”).

¹⁴ Final SGEIS 2015 at RTC-16.

¹⁵ 1992 GEIS at 12-27 (discussing the use of a “slug” of ethane, propane, and butane in enhanced oil recovery).

¹⁶ Nick Reisman, DEC unveils recommendations for hydrofracking, YNN (Jul. 7, 2011), available at <http://centralny.ynn.com/content/politics/548676/dec-unveils-recommendations-for-hydrofracking/>.

considerations.”,¹⁷ we ask that the Department give the same consideration to the unique hazards of LPG fracturing, as required by SEQRA.

Sincerely,

Kate Sinding, Senior Attorney
Natural Resources Defense Council

Deborah Goldberg, Managing Attorney, Northeast Office
Earthjustice

Roger Downs, Conservation Director
Sierra Club Atlantic Chapter

Nadia Steinzor, Marcellus Shale Regional Organizer
EARTHWORKS Oil & Gas Accountability Project

Wes Gillingham, Program Director
Catskill Mountainkeeper

Kate Hudson, Watershed Program Director
Riverkeeper, Inc.

Sarah Eckel, Legislative & Policy Director
Citizens Campaign for the Environment

Russ Haven, Senior Staff Attorney
New York Public Interest Research Group

Neil F. Woodworth, Executive Director and Counsel
Adirondack Mountain Club

Alex Beauchamp, Northeast Region Director
Food and Water Watch

Elizabeth Moran, Water & Natural Resources Associate
Environmental Advocates of New York

Julia Walsh, Campaign Director
Frack Action

cc: Basil Segos, Deputy Secretary for the Environment
Ed McTiernan, General Counsel
Eugene Leff, Deputy Commissioner Remediation and Materials Management

Attached: 4/11/12 letter

¹⁷ 2015 Final Findings Statement on HVHF at 42.

ADIRONDACK MOUNTAIN CLUB · CATSKILL MOUNTAINKEEPER · CITIZENS CAMPAIGN FOR THE ENVIRONMENT · DELAWARE RIVERKEEPER NETWORK · EARTHJUSTICE · EARTHWORKS OIL & GAS ACCOUNTABILITY PROJECT · ENVIRONMENT AMERICA · ENVIRONMENT NEW YORK · ENVIRONMENTAL ADVOCATES OF NEW YORK · NATURAL RESOURCES DEFENSE COUNCIL · NEW YORK PUBLIC INTEREST RESEARCH GROUP · RIVERKEEPER, INC. · SIERRA CLUB · SIERRA CLUB ATLANTIC CHAPTER · THEODORE GORDON FLYFISHERS

BY EMAIL AND FIRST CLASS MAIL

April 11, 2012

Joseph Martens
Commissioner
New York Department of Environmental Conservation
625 Broadway
Albany, NY 12233-1011

Re: State Environmental Quality Review Act Requires Additional Comprehensive Environmental Review Before Permitting Liquefied Petroleum Gas (Propane) Fracturing.

Dear Commissioner Martens:

We are writing to you with respect to reports regarding potential applications to conduct shale fracturing using liquefied petroleum gas ("LPG") in New York. Several newspapers have reported that the Canadian gas company, GasFrac Energy Services, Inc. ("GasFrac"), recently reached a preliminary agreement with the Tioga County Landowners Association to employ Houston-based driller, eCORP in drilling several gas wells in Tioga County using the unconventional technique of fracturing with LPG.¹ These articles further suggest that the coalition's strategy is to bypass the current *de facto* moratorium on high-volume hydraulic fracturing ("HVHF") through use of an alternative fracturing agent. New York law does not permit shale fracturing with LPG at this time. Shale fracturing using LPG has not been previously evaluated by the Department. Given both the unique and significant risks of this activity, as well as the potential for significant adverse environmental impacts, an application to perform LPG fracturing would plainly necessitate the preparation of either a supplemental-generic or site-specific environmental impact statement ("EIS") prior to well permitting.

The State Environmental Quality Review Act ("SEQRA") requires all state agencies, including DEC, to prepare or cause to be prepared an EIS for "any action...which may have a significant effect on the environment."² This includes actions subject to discretionary agency

¹ Associated Press, *NY Landowners Plan to Frack Using Liquid Propane*, PENNLIVE.COM (Mar. 29, 2012) available at: <http://www.pennlive.com/newsflash/index.ssf/story/ny-landowners-plan-to-frack-using-liquid/3253f759fcf943a9b48b748d43c3c24c>.

² E.C.L. § 8-0109(2).

decisions, such as departmental permitting of natural gas wells.³ In circumstances where the impacts from separate actions are common and predictable, a generic EIS may be prepared analyzing the impacts of all such actions generally and cumulatively in lieu of preparing an individual EIS for each such action.⁴ A generic EIS, however, only covers those actions which are adequately addressed within scope of the EIS. Subsequent proposed actions which may significantly affect the environment, but which are not adequately addressed, require preparation of a supplemental generic EIS,⁵ or else site-specific environmental review.⁶

Pursuant to this mandate, DEC completed a generic EIS in 1992 (“GEIS”) addressing environmental impacts associated with conventional oil and gas exploration.⁷ In 2008, however, recognizing that the GEIS failed to adequately consider a number of hazards newly posed by proposed HVHF activities in the state, then-Governor Paterson directed the DEC to prepare a supplemental GEIS (“SGEIS”) to study “all potential new impacts” from HVHF.⁸ The Department additionally recognized that both the scale of anticipated HVHF activities and the potential for new significant impacts – such as those associated with the high-pressure injection of large quantities of then-unknown chemical additives below groundwater aquifers – were such that permitting HVHF statewide presented significant issues needing to be “addressed comprehensively and publicly.”⁹

Likewise, LPG fracturing presents considerable known risks which are distinct from those posed by either HVHF or conventional drilling, likely to significantly impact the environment, and not adequately addressed in either the GEIS or the revised draft SGEIS for HVHF. The main component of LPG used in fracturing, propane gas, is itself highly flammable, and because it is heavier than air, it naturally pools on the ground when leaked, creating a clear and substantial threat of explosion¹⁰ – a risk highlighted by two major explosions last year at GasFrac well sites that injured fifteen workers and caused the company to suspend all of its operations for two weeks.¹¹ Additional hazards will no doubt result from trucking thousands of gallons of LPG to the well site,¹² compressing and re-condensing the LPG for reuse, and mixing the LPG with chemicals for use in fracturing.¹³

³ 6 N.Y.C.R.R. § 617.2(b)(1)(iii).

⁴ 6 N.Y.C.R.R. § 617.10.

⁵ 6 N.Y.C.R.R. § 617.10(d)(4).

⁶ E.C.L. § 8-0109(2).

⁷ DEC, Generic Environmental Impact Statement on the Oil, Gas and Solution Mining Regulatory Program (1992) [hereinafter 1992 GEIS].

⁸ Pete Grannis, *Commissioner’s Testimony at NYS Assembly Hearing on Oil and Gas Drilling* (Oct. 15, 2008) available at <http://www.dec.ny.gov/energy/47910.html>.

⁹ See *id.*; Pete Grannis, *Commissioner’s Editorial on Marcellus Shale* (Aug. 11, 2008) available at <http://www.dec.ny.gov/energy/46570.html>.

¹⁰ Canadian Centre for Occupational Health and Safety, *Working Safely with Propane* (last visited Apr. 4, 2012) available at http://www.ccohs.ca/oshanswers/chemicals/chem_profiles/propane/working_pro.html.

¹¹ Nathan VanderKlippe, *Husky Well Fire Injures Several Alberta Workers*, CTV NEWS (last visited Apr. 3, 2012) available at: <http://www.ctv.ca/generic/generated/static/business/article1932947.html>.

¹² Although LPG fracturing uses about one quarter of the truck trips used in normal hydraulic fracturing, these trucks will be carrying highly explosive liquefied gasses as opposed to water.

¹³ See e.g. Don LeBlanc et al., *Application of Propane (LPG) Based Hydraulic Fracturing in the McCully Gas Field, New Brunswick, Canada*, SOCIETY OF PETROLEUM ENGINEERS (June 2011) abstract available at <http://www.onepetro.org/mslib/app/Preview.do?paperNumber=SPE-144093-MS&societyCode=SPE>.

While LPG fracturing has been presented as more environmentally benign than water-based HVHF, both require the addition of toxic chemicals. In LPG fracturing, additives include gelling agents, breakers and crosslinkers, and may contain chemicals such as surfactants, amines, iron salts, and other contaminants.¹⁴ According to Ronald Bishop, Ph.D., Chemistry and Biochemistry Department of State University of New York, an early GasFrac promotional brochure listed an aluminum sulfate complex of tributylphosphate, which has been used as a nerve gas stimulant, as one of the chemical agents used in the process.¹⁵ In addition, as with HVHF, LPG fracturing returns polluting products to the surface that must be properly handled and disposed; in this case, flammable gases that would have to be collected in pressurized tanks or flared¹⁶ – a step generating air emissions and leaks that can harm public health and safety.

Even more alarming than the known risks are the unknown and potentially numerous hazards associated with LPG fracturing. Because the use of LPG fracturing is recent and it employs a proprietary method owned by GasFrac, there is little publicly-available information on the process.¹⁷ GasFrac has multiple patents for its LPG fracturing system, often with slightly different descriptions of chemical additives.¹⁸ Because GasFrac considers the actual chemical recipes as “trade secrets,”¹⁹ it is difficult to know exactly what chemicals are actually being used as gelling agents or for other purposes. To date, there has been no independent empirical analysis of the complete life cycle of LPG fracturing.

Neither the known nor the unknown risks from LPG fracking have ever been adequately addressed in any EIS. By its own terms, the revised draft SGEIS is limited to the study of HVHF, defined as horizontal or vertical wells “using 300,000 gallons of water or more per well.”²⁰ Furthermore, it frankly acknowledges that LPG fracturing was not considered within the

¹⁴ See, for example, descriptions from two of GasFrac’s patent applications: “One example of a suitable gelling agent is created by first reacting diphosphorous pentoxide with triethyl phosphate and an alcohol... The orthophosphate acid ester formed is then reacted with aluminum sulphate to create the desired gelling agent.” GasFrac, “Liquified Petroleum Gas Fracturing System,” Intl. Patent App. No.: PCT/CA2007/000342 (Filed: February 2, 2007) *available at* <http://bit.ly/HiSdVV>; “An example of a commercially available ferric iron activator composition is ‘EA-3 TM’... Suitable activator compositions also may comprise amines, surfactants, water, or other suitable components.” GasFrac, “Volatile Phosphorus-free Gelling Agents,” Intl. Patent App. No.: PCT/CA2009/001159 (Filed: Aug. 2009) *available at* <http://bit.ly/HgF4h8>.

¹⁵ Alejandro Freixes, *Propane, GasFrac’s CTO, and the cure for water fracking*, PATEXIA (Dec. 12, 2011) *available at* <http://www.patexia.com/feed/exclusive-propane-gasfrac-s-cto-and-the-cure-for-water-fracking-1719>

¹⁶ GasFrac, LPG Frac Flow Back Guide, Section 7.0. “LPG Hazards,” (Jan. 2011). <http://www.gasfrac.com/assets/files/LPGVantageFracFlowbackGuidev9finalJan2011.pdf>

¹⁷ Anthony Brino & Brian Nearing, *New Waterless Fracking Method Avoids Pollution Problems, But Drillers Slow to Embrace It: Little-noticed drilling technique uses propane gel, not water, to release natural gas. Higher cost, lack of data and industry habit stand in the way*, REUTERS (November 6, 2011) *available at* <http://www.reuters.com/article/2011/11/06/idUS375448304420111106>.

¹⁸ GasFrac, GasFrac Annual Information Form for the Year Ended December 31, 2011, 8-12 (Dec. 31, 2011) (A table of GasFrac patents can be found under “Intellectual Property.”) *available at* <http://www.gasfrac.com/assets/files/2011%20AIF%20March%2016%202012.pdf>

¹⁹ *Id.* at 8 (“GASFRAC relies upon trade secrets, its know-how and patent applications that have been filed or are in preparation in order to provide its innovative services to its customers.”)

²⁰ DEC, Revised Draft Supplemental Environmental Impact Statement, 2-1 (Sept. 2011) (emphasis added) [hereinafter 2011 SGEIS] *available at* <http://www.dec.ny.gov/data/dmn/rdsgeisfull0911.pdf>. That HVHF, as defined by DEC, only applies to water as the primary carrier fluid is supported by the proposed regulatory definition of HVHF. Proposed 6 NYCRR § 560.2(b)(8) (defining HVHF as “the stimulation of a well using 300,000 gallons or more of water as the primary carrier fluid in the hydraulic fracturing fluid.”).

scope of the study,²¹ noting that “at the current time, this technology is not mature enough to support development of the Marcellus Shale and other low-permeability gas reservoirs.”²² LPG fracturing is likewise well outside of the scope of the 1992 GEIS. LPG itself is discussed only in the context of underground storage of the gas, and reference to LPG constituents used in fracturing, such as “propane” and “butane,” appears only once in the entire document.²³

Bearing all of this in mind, we write to remind the Department not only of the importance of comprehensive environmental review (either generic or site-specific) before permitting any LPG fracturing wells in New York State, but also of its mandatory nature. As you have said in reference to the environmental review process for permitting HVHF – “The goal of the process all along has been to identify the risks associated with [HVHF], to see if they can be mitigated in a way that protects the environment.”²⁴ We ask that the Department give the same consideration to the unique hazards of LPG fracturing, as required by SEQRA.

Sincerely,

Kate Sinding, Senior Attorney
Natural Resources Defense Council

Deb Nardone, Director, Natural Gas Campaign
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Deborah Goldberg, Managing Attorney, Northeast Office
Earthjustice

Nadia Steinzor, Marcellus Shale Regional Organizer
EARTHWORKS Oil & Gas Accountability Project

Anthony Ingraffea, Ph.D., PE, Dwight C. Baum Professor of Engineering
Cornell University

Neil F. Woodworth, Executive Director and Counsel
Adirondack Mountain Club

²¹ 2011 SGEIS at 9-9. (“Well applications that specify and propose the use of LPG as the primary carrier fluid will be reviewed and permitted pursuant to the 1992 GEIS and Findings Statement.”)

²² *Id.*

²³ 1992 GEIS at 12-27 (discussing the use of a “slug” of ethane, propane, and butane in enhanced oil recovery).

²⁴ Nick Reisman, *DEC unveils recommendations for hydrofracking*, YNN (Jul. 7, 2011) available at <http://centralny.ynn.com/content/politics/548676/dec-unveils-recommendations-for-hydrofracking/>.

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Sarah Eckel, Legislative & Policy Director
Citizens Campaign for the Environment

Cathleen Breen, Clean Water Program Director
New York Public Interest Research Group

John L. Barone, Vice-President of Conservation
Theodore Gordon Flyfishers, Inc.

cc: Steven Russo, Deputy Commissioner and General Counsel

